

EXHIBIT 13

PATENT ROUNDTABLE

ITU Headquarters, Geneva
10 October 2012

Submitted by: **Jorge L. Contreras¹**

RETHINKING RAND: SDO-BASED APPROACHES TO PATENT LICENSING COMMITMENTS

ABSTRACT

So-called “reasonable and nondiscriminatory” (RAND) licensing commitments have been utilized by standards-development organizations (SDOs) for years in an attempt to alleviate the risk of patent hold-up in standard-setting. These commitments, however, have proven to be vague and offer few assurances to product vendors or patent holders. A recent surge of international litigation concerning RAND commitments has brought this issue to the attention of regulators, industry and the public, and many agree that a better approach is needed. In this paper, I identify seven “first principles” that underlie the licensing and enforcement of standards-essential patents (SEPs). These can be summarized as follows: (1) certainty is preferable to uncertainty concerning the cost of implementing a technical standard, (2) there is a meaningful upper limit on reasonable royalty rates, (3) information regarding RAND terms should be available before adoption of a standard, (4) individual RAND commitments must be constrained by the aggregate royalty burden on a standard, (5) non-SEPs need not be bundled with SEPs, (6) SEPs should not be used to block implementation of a standard unless the recovery of monetary compensation is impossible, and (7) RAND commitments should travel with the relevant patent.

Based on these first principles, I propose an SDO-driven approach to addressing the uncertainty of RAND commitments that is based on certain beneficial attributes of patent pools. I call this a “pseudo-pool” approach, as it draws on pooling strategies, but is adapted for use in the more flexible and prolific world of SDO standard-setting. The pseudo-pool approach includes the following elements: (a) SDO participants must declare SEPs in good faith, (b) SDO working groups that include patent holders and potential vendors establish aggregate royalty rates for each standard, (c) patent holders continue to grant licenses on RAND terms, subject to the aggregate royalty agreement, (d) each patent holder is entitled to a share of the aggregate royalty based on a proportionality measure, (e) there is a defined penalty for over-declaration of SEPs, (f) each patent holder is permitted to license its SEPs independently of the pseudo-pooling arrangement, (g) parties must waive their right to seek injunctive relief for infringement of SEPs unless monetary damages have proven impossible to collect, and (h) commitments made with respect to SEPs must bind all future transferees of such SEPs. This proposal requires the adoption of joint ex ante negotiation of royalty rates near the outset of a standardization project, conduct

¹ Associate Professor of Law, American University Washington College of Law, Washington, D.C. Research assistance by Chris Pepe is gratefully acknowledged. This paper is a work in progress. The author welcomes all comments, corrections and suggestions. Please send correspondence to contreras@wcl.american.edu.

that has been viewed with favor by several regulatory agencies and acknowledged as offering various procompetitive benefits.

INTRODUCTION

Technical interoperability standards pervade the modern networked economy, enabling different vendors' computers, networks and communications devices to operate seamlessly and invisibly to the consumer. A large number of these standards are developed collaboratively by market participants in voluntary standards-development organizations (SDOs). Patents, which are available on a wide range of technologies and processes, enable a patent holder to exclude others from making, using or selling the patented technology. Thus, in order to ensure the greatest possible adoption of standardized technologies, many SDOs require their participants to permit all potential vendors of such standardized technologies to operate under their patents. In doing so, patent holders must generally commit to make such patents available for use on terms that are "reasonable" and "non-discriminatory" (RAND).² The patents covered by RAND commitments are typically those that are essential to use the standardized technology (so-called "standards-essential patents" or SEPs).³

If patented technology is included in a standard, RAND commitments are intended to assure vendors that a patent license will be available on terms that are, at least roughly, understood. At a minimum, RAND commitments tell vendors that they will not be prevented from using a standardized technology, so long as they obtain the required license (which may sometimes involve a monetary cost). Because of this baseline assurance, and because RAND commitments require relatively little overhead to enact, their use has become widespread among SDOs. RAND commitments (or commitments to license on a royalty-free basis, sometimes called RF or RAND-z commitments) are

² It is important to distinguish a RAND commitment, which is a promise to grant a license in the *future*, from the actual patent license that is subsequently granted by the patent holder, typically pursuant to a written license agreement. See ABA (2007), p. 47 ("a Licensing Commitment is not an actual license and does not include all of the terms that the Patent Holder may include in the license it offers to prospective licensees. The Licensing Commitment may, however, prescribe the general nature of some of the terms and/or prohibit other terms"). While some commentators have argued that the mere existence of a RAND commitment should itself be considered the grant a license (see Lemley (2002), p. 1925), I find this conclusion difficult to reconcile with both the actual language of such commitments and the likely intentions of SDO participants. For purposes of this paper, I will use the term RAND to refer both to "reasonable and non-discriminatory" terms, as well as "fair, reasonable and non-discriminatory" (FRAND) terms that are specified by some SDOs. There appears to be no material difference between these two terms in practice.

³ While other patents may be useful in practicing a standardized technology and may offer various commercial advantages, these are generally not covered by the RAND commitment and may be licensed and enforced on terms of the patent holder's choosing (subject to applicable antitrust laws).

required of all SDOs accredited by the American National Standards Institute (ANSI)⁴ and are also utilized widely among SDOs throughout Europe and elsewhere.⁵

But despite the intuitive appeal of RAND commitments, a consistent and practical definition of RAND terms has proven difficult to pin down. Virtually no SDO defines precisely what RAND means, and many affirmatively disclaim any role in establishing, interpreting or adjudicating the reasonableness of licensing terms.⁶ In fact, some SDOs flatly prohibit discussion of royalty rates within the SDO setting, making the likelihood of developing any consensus view of reasonable licensing terms very unlikely.⁷

For this reason, it is a common complaint that RAND commitments are vague and offer little, if any, useful guidance to SDO participants.⁸ Such vagueness and ambiguity may permit opportunistic patent holders⁹ to insist on licensing terms, particularly royalty rates, that are not bounded by meaningful limitations.¹⁰ That is, in the absence of any generally-accepted upper limit on royalty rates,

⁴ The American National Standards Institute (ANSI) includes in its membership approximately 1,300 corporations, 260 industry groups and numerous governmental agencies, academic institutions and municipalities. The ANSI patent policy states that standards may include items covered by patents if the patent holder has agreed to grant a license without consideration or “on reasonable terms that are demonstrably free of any unfair discrimination.” ANSI (2012).

⁵ Of 36 SDO patent policies studied by Lemley in 2002, 29 contained RAND licensing requirements and three more encouraged RAND licensing. Lemley (2002), p.1906. A more recent study found that of 12 major SDOs studied, 10 explicitly specify RAND licensing as an option in their IPR policies. Bekkers & Updegrove (2012), p. 89, table 13.

⁶ See, e.g., IEEE Standards Assn., Policies and Procedures Sec. 6.3.1 (“The IEEE is not responsible for ... determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory”).

⁷ See Lemley (2002), p. 1965 (observing that such restrictions are generally intended to shield SDOs from antitrust liability for collusive price fixing by its participants).

⁸ FTC (2011A), p. 192 (“Panelists complained that the terms RAND and FRAND are vague and ill-defined”), Rysman & Simcoe (2011), p. 2 (“RAND commitments are not a workable solution to SSOs’ intellectual property problem”), Gilbert (2011), p. 859 (the “fair” and “reasonable” components of FRAND are “often inherently ambiguous”), Lichtman (2010), p. 1031 (“it is something of an outrage that the language of the RAND commitments offers so little guidance”); Majoras (2005), p. 5 (“Experience has shown, however, that some agreements on RAND rates can be vague and may not fully protect industry participants from the risk of hold up”); Lemley (2002), p. 1964 (“without some idea of what those terms are, reasonable and nondiscriminatory licensing loses much of its meaning”), and Miller (2007), p. 357 (reviewing the earlier literature in this vein).

⁹ While most of the literature focuses on opportunistic behavior by patent holders, it is also possible for standards vendors to act opportunistically. See, e.g., Qualcomm (2011), p. iii (warning of “reverse hold-up” of licensors through the collusive action of licensees who refuse to pay even reasonable royalty for standards-essential patents).

¹⁰ FTC (2011A), p. 192 (“there is much debate over whether such RAND or FRAND commitments can effectively prevent patent owners from imposing excessive royalty obligations on licensees”).

patent holders may charge whatever the market will bear. In the case of standards that have already been widely-adopted in the market, switching costs may be high and there may be no reasonable alternative technology, giving the patent holder substantial leverage to charge excessive rates in such negotiations. This phenomenon has been termed patent “hold-up” and is discussed extensively in the literature.¹¹

Some commentators, however, argue that the indeterminacy of RAND commitments is intentional – a “feature” rather than a “bug” in the system.¹² Epstein, Keiff and Spulber have argued that the flexibility inherent in most RAND obligations is both beneficial and necessary, in that it enables parties to negotiate efficiently to differing outcomes based on their individual interests, priorities and negotiating resources.¹³ Gerardin argues that any license terms agreed by parties in bilateral “market-driven, arms-length negotiations” should, by definition, be considered reasonable and thereby compliant with RAND commitments.¹⁴ These commentators express a general satisfaction with the current state of standards licensing practices and question the premise that hold-up is a problem (or that it even exists at all). Not surprisingly, their perspective is consistent with that of market participants that earn substantial revenue from patent licensing.¹⁵

But whether or not one is content with the theoretical merits of unspecified RAND requirements, one thing is certain: in the past few years, litigation over the meaning of RAND has dramatically increased both in quantity and potential market impact. Most significant among these recent suits are the so-called “smart phone wars”, in which the largest global manufacturers of mobile computing and telecommunications devices and software – Apple, Motorola, Samsung, Microsoft and others – have been engaged in a high-stakes battle over the infringement of dozens of patents, including several SEPs subject to RAND commitments.¹⁶ These cases involve product markets measured in the tens of billions of dollars, and royalty demands that also extend into the billions.

¹¹ Farrell (2007), Lichtman (2010), p. 1033.

¹² *See, e.g.*, Qualcomm (2011), p. 19 (“in the case of ETSI ... the history of its IPR policy makes clear that it was a considered decision of the membership *not* to define these terms with any inflexible precision, nor by reference to any particular economic theory ... Indeed, the flexible nature of RAND is a positive attribute of SSO rules”).

¹³ Epstein, Keiff & Spulber (2012), p. 12. *See also* Miller (2007), p. 370 (calling RAND commitments “appropriately open-textured”).

¹⁴ Gerardin (2006), p. 50.

¹⁵ *See, e.g.*, Qualcomm (2011). Qualcomm earned 36% of its net revenue from patent licensing activity in 2011, approximately \$5.42 billion, yielding an enviable 88% operating margin (Qualcomm, Inc., 2011 Annual Report on Form 10-K, at 30, 39).

¹⁶ For a recent snapshot of the way that RAND issues are involved in the larger patent suits among these parties *see, e.g.*, Contreras (2012). While the smart phone wars are the latest round of RAND disagreements, they have not been the first. Disputes regarding the meaning of RAND commitments also arose in *Townshend v. Rockwell Int'l Corp.*, 55 U.S.P.Q.2d (BNA) 1011, 1018 (N.D. Cal. Mar. 28, 2000) (holding that a patent holder's demand for royalties did not constitute a violation of the antitrust laws), *Broadcom Corp. v. Qualcomm Inc.*, First Amended Complaint at 2, C.A. No. 05-3350 (D.N.J. 2005), LEXSEE 2005 U.S. Dist. Ct. Pleadings 3350A, CUTFATT petition.

Disputes regarding RAND commitments have generally arisen when a patent holder and a vendor cannot agree on the terms of a license for standards-essential patents, typically after the standard is adopted in the market. These disputes often revolve around the patent holder's proposed royalty rate and whether it is "reasonable". However, RAND disputes can also involve the reasonableness of non-royalty terms such as requirements that the vendor license its own patents to the patent holder ("reciprocity"), or that the license be "suspended" if the vendor threatens the patent holder with litigation ("defensive suspension"). When parties cannot agree on license terms, no license is granted. When no license is granted, a vendor that complies with a standard is likely to infringe patents that are essential to that standard. The parties are thus left in a difficult and ambiguous situation.¹⁷ Can the patent holder sue the vendor for infringing the patent? If so, what remedies are available? Can the vendor defend itself on the basis that the patent holder violated its RAND commitment by offering terms that were unreasonable? How long must the parties negotiate before one or the other of them is deemed to be "unreasonable"? And how does "fairness" figure in this picture?

The prevalence of these questions has led to a vigorous debate among academics, regulators and industry representatives relating to the scope and contours of RAND obligations. Much of the recent commentary has focused on three general issues: (1) whether and to what extent breaches of RAND commitments are actionable under antitrust and competition laws,¹⁸ (2) how royalty levels should be calculated/negotiated in the face of RAND commitments,¹⁹ and (3) whether it is appropriate to grant a patent holder an injunction preventing the use of standardized technology after the parties have failed to agree on RAND licensing terms.²⁰

Without a doubt these issues are important, particularly in the context of litigation and pending disputes among market participants. In this paper, however, I explore potential solutions to RAND-related issues that can be implemented *before* they erupt into costly and disruptive litigation. In particular, I focus on policy approaches that SDOs can adopt to improve the efficiency of their participants' interactions concerning SEPs. SDO-based approaches have gained currency in the past few months, and a set of similar SDO-focused proposals has recently been advanced by individuals

¹⁷ This fact pattern is alleged, more or less, in the suits currently pending between Motorola Mobility (now owned by Google) and Microsoft. In those actions, Motorola allegedly offered Microsoft a license under patents covering aspects of the popular IEEE 802.11 WiFi standard and ITU H.264 video compression standard. Both IEEE and ITU require patent holders to license their SEPs on RAND terms. Motorola offered a license to Microsoft at a royalty rate of 2.25% of the price of each end product utilizing the technology, there being evidence that this rate was consistent with the rates charged by Motorola to other licensees. For Microsoft, however, the end products requiring use of the standards included laptop computers and X-Box gaming consoles, each of which sells individually for hundreds of dollars. According to Microsoft, Motorola's royalty demand would have amounted to more than \$4 billion per year. Microsoft argues that this royalty demand is so high that it cannot be considered "reasonable" and thereby violates Motorola's RAND obligations to IEEE and ITU, as to which Microsoft claims to be a third party beneficiary.

¹⁸ See, e.g., Speegle, (2012), Cary, et al. (2011), Hockett & Lipscomb (2009), Cary, Work-Dembowski & Hayes (2008).

¹⁹ See, e.g., Michel (2011), Hurwitz (2008), Lemley & Shapiro (2007), Farrell, et al. (2007), Layne-Farrar, Padilla & Schmalensee (2007).

²⁰ See, e.g., Yeh (2012), Chien, et al., (2012), Chien & Lemley (2012), Michel (2011), Lichtman (2010), Farrell, et al. (2007), Lemley & Shapiro (2007).

connected with the principal antitrust regulatory enforcement agencies in the U.S. and EU.²¹ I will address these proposals and others in the following analysis.

A. QUESTIONING THE STATUS QUO: BILATERAL NEGOTIATION

SDOs typically impose RAND obligations through policy documents or membership agreements.²² Once these policies are in place, SDOs generally maintain a “hand’s off” approach toward the licensing of SEPs by their participants. That is, they leave patent holders and vendors to identify and negotiate with one another with almost no involvement by the SDO. Patent holders, who often disclose their SEPs in public statements required by the SDO, either wait for vendors to approach them to request licenses or seek out vendors that are likely to require licenses. In either case, the parties are left to conduct private, bilateral contract negotiations in the hope of reaching mutually-agreeable terms. SDOs do not monitor, track, or even record the results of these negotiations, and in most cases are not even aware that they take place. Negotiations are typically conducted pursuant to non-disclosure agreements, so vendors cannot disclose or share the terms that they were offered with other vendors, participants in the SDO or the SDO itself.

1. *Ex Ante versus Ex Post Negotiations.* As noted above, several commentators (whom I term “bilateralists”) have argued that private, bilateral negotiations are likely to result in efficient royalty rates and other terms for SEPs, particularly if they are conducted *prior to* the adoption and lock-in of a standard.²³ The theory is that before adoption of a standard, a patent holder is not assured that the technology covered by its patent will be adopted in the standard. If, during pre-adoption negotiations, it demands excessive royalty rates, then vendors are likely to vote against the incorporation of that technology into the standard. Patent holders are thus constrained from demanding unreasonable terms by the risk of being “designed out” of a standard.²⁴

²¹ See Wayland (2012) and Scott-Morton (2012).

²² The enforceability of RAND commitments, and the legal mechanisms by which such commitments may be imposed on SDO participants and third parties, is subject to some debate and is beyond the scope of this paper. Theories that have been advanced to support such enforceability include contract law, equitable estoppel, antitrust theories and traditional property law theories.

²³ See, e.g., Gilbert (2011), p. 862-65.

²⁴ See, e.g., Lichtman (2010), p. 1033, offering this example:

consider a situation in which two comparable technologies are vying for inclusion in a given standard: Dolby's high-fidelity audio compression codec on the one hand and DTS's rival audio compression technology on the other. Were prices being negotiated at the time of the selection, participants in the standard-setting process would compare the Dolby and DTS approaches. They would identify advantages and disadvantages, and they would ultimately offer the winner a price that reflected its marginal value as compared to the unsuccessful alternative. If the winning patent holder were to hold out for more, standard-setting participants would presumably threaten to switch to the second-best technology. Ultimately, a competitive bidding process would typically yield something close to the efficient price.

Bilateralist logic works, however, only if licensing negotiations occur *before* the adoption of a standard (“*ex ante*”). As many commentators have pointed out, once a standard is adopted, the patent holder is no longer at risk of being designed-out of the standard, and the burden of a failed negotiation shifts to the vendor, who risks being locked out of the market for interoperable products.²⁵ This reversal gives the patent holder significant leverage in any post-adoption licensing negotiation, because the vendor often has no viable choice other than accepting a license on the terms offered by the patent holder, even if they could be construed as “unreasonable”. As a result, vendors have a clear incentive to seek out and negotiate licenses with patent holders as early in the standardization process as possible. Many SDOs even facilitate this process by requiring patent holders to disclose up-front all patents that they believe to be essential to a standard under development, and if not, at least to disclose the existence of one or more potentially essential patents. In theory, these requirements inform vendors in advance all of the patent licenses that they must negotiate in order to implement a particular standard. And, if there are too many, or if the aggregate royalties appear to be too high, vendors can legitimately attempt to influence the standardization process to ensure that less costly technologies are included in the standard (e.g., by choosing technical alternatives that are not covered by such costly patents, or by designing around patented technologies).

2. *Why Licenses are Not Negotiated in Advance (even though they should be).* But if it is so clearly in a vendor’s interest to negotiate a patent license prior to the adoption of a standard, and patent holders are known and required to offer licenses on RAND terms, then why don’t all such licenses get negotiated in advance, before standards are adopted? As it turns out, *very few* such licenses are negotiated prior to the adoption of a standard.²⁶ Is this omission simply a result of vendor negligence and inattention? Probably not. There are many reasons why patent licenses do not get negotiated prior to the adoption of standards and parties are willing to invest substantial technical resources simply on the basis of RAND commitments. In some cases, vendors may never have the opportunity to negotiate prior to the adoption of a standard, either because they were not aware of the standard before it was adopted, they were not part of the standards-development process, they did not participate in the relevant product market at the time, or because broad adoption of the standard was unexpected.²⁷

a. *Efficiencies of Not Negotiating.* But even when vendors participate in the standardization process and are aware of patents that might implicate a standardized technology, few seek out licenses. There are rational justifications here, as well. First, negotiating patent licenses requires the expenditure of time, effort and money. Many large companies are involved in a hundred or more SDOs simultaneously, each developing multiple (sometimes dozens of) standards. But while

²⁵ See, e.g., Lichtman (2010), p.1033-34.

²⁶ This statement is based on the author’s experience and is consistent with that of other observers including the U.S. FTC (FTC (2011b), p. 28,037). However, not all agree. For example, Qualcomm states that it entered into numerous licenses for patents covering the WCDMA standard prior to its adoption, including manufacturers representing “more than 60% of royalty-bearing unit sales in 2005”. Qualcomm (2011), p. 11.

²⁷ One example of this phenomenon is the now-ubiquitous Uniform Serial Bus (USB) standard, which was originally developed to improve the connection between personal computers and stand-alone printers and similar peripheral devices. At the time it was developed, very few expected that USB would become a broadly-adopted standard used in a wide range of computer memory and other products. See Nied (2011), p. 117.

thousands of engineers may be involved in standardization projects across the company, that level of resource commitment is seldom matched by the corporate legal department. Armies of lawyers would be required to negotiate all of these patent licenses, potentially increasing the cost of standardized technology and bogging down the standardization process. Moreover, much of this effort would be spent on standards that were never adopted, or that failed in the marketplace.²⁸ As Doug Lichtman explains, “the [F]RAND commitment thus simplifies the conversation, allowing the engineers alone to run the show until the technical details are fully selected and documented.”²⁹

b. The Dilemma of Over-Disclosure. Second, despite SDO rules that require patents to be disclosed only if they are (or are likely to be) “essential” to the implementation of a standard, there is usually no verification that this is the case.³⁰ In other words, patent holders may disclose to an SDO patents that are not actually essential, or even relevant, to the standard with few consequences.³¹ Given that patent holders could face serious potential liability for *failing* to disclose essential patents to an SDO (including claims of anticompetitive behavior, fraud and deceptive conduct),³² they have a strong incentive to disclose all patents that have even a remote possibility of being relevant to a standard.³³ And, given that patent holders often compute royalty rates based, at least in part, on the number of patents being licensed, there is a purely commercial reason for patent holders to claim as many SEPs as possible. These incentives, for better or for worse, result in significant over-disclosure of patents within SDOs, a conclusion that is borne out by empirical data. For example, recent studies have found that only 27% and 28% of patent families declared “essential” to ETSI’s GSM and WCDMA standards, respectively, were actually essential to implementation of those standards.³⁴ Typically, such over-disclosure would not become manifest until a patent holder sought to enforce its patents against a vendor, at which point a court would decide whether the patent were infringed. But prior to adoption of a standard, a vendor is confronted with the prospect of engaging in multiple time-consuming and costly negotiations to license patents that may not, in the end, actually be essential to a standard (even if the standard is ultimately successful, which is also uncertain). It may thus be rational for a vendor to adopt a ‘wait and see’ approach and engage in licensing negotiations only with patent holders that approach it with credibly essential patents. In most cases, such approaches will likely occur only after the adoption of a standard and the release of a vendor product that implements the standard and is likely infringing.

²⁸ See Lichtman (2010), p. 1028 (describing failed standards such as DAT and HD-DVD).

²⁹ Lichtman (2010), p. 1028.

³⁰ This situation is quite different than that in patent pools, in which a significant up-front investment is made to verify the “essentiality” of all patents proposed to be included in the pool.

³¹ See, e.g., Lemley (2007), p. 157. It is possible that intentional over-disclosure could support a claim of fraud or deception, especially if the patent holder then sought to charge royalties on patents that were not essential to the standard. However, such a case has not yet, to my knowledge, arisen.

³² See *In re. Rambus, Inc.*, 2006 WL 2330117, 2006-2 Trade Cas. 75364 at 53 (FTC, Aug. 2, 2006), rev’d, 522 F.3d 456 (D.C. Cir. 2008), *Qualcomm v. Broadcom*, 584 F.3d 1004 (Fed. Cir. 2008), *In re. Dell Computer Corp.*, 121 F.T.C. 616 (1996).

³³ But see Ganglmair & Tarantino (2011), p. 3 (arguing that patent holders may strategically delay disclosure of patents in order to increase leverage in licensing negotiations).

³⁴ Fairfield Resources Intl. (2007) and Fairfield Resources Intl. (2008).

c. *Don't Wake the "Sleeping Dogs"*. Vendor inaction is further justified by the knowledge that many patent holders engaged in standards development do not actively seek to license or enforce their SEPs. These companies have been termed "sleeping dogs",³⁵ and are generally believed to hold SEPs primarily for "defensive" purposes (i.e., to use in counterclaims should they be sued for patent infringement, or as bargaining chips in licensing negotiations with other patent holders). Vendors are loathe to approach sleeping dogs for licenses, as doing so could "wake" these companies and result in royalty obligations that otherwise would not have materialized. Thus, it is a common strategy to let these sleeping dogs lie.

Add to all of the above the inescapable fact that patent holders who actively seek to monetize their patent portfolios know very well that their leverage in licensing negotiations increases dramatically once a standard is adopted. With this in mind, it is not surprising that such patent holders have an incentive to drag their feet, and to defer seeking out potential licensees for royalty negotiations until after a standard is adopted and widely implemented.

Thus, despite theoretically sound rationales for leaving the licensing of SEPs to private *pre-adoption* bilateral negotiations among parties, there are many reasons that pre-adoption license negotiation is relatively rare. Thus, we are left with a situation in which RAND licenses for SEPs are being negotiated *after* adoption and lock-in of standards. When such negotiations occur after lock-in, a vendor's principal protection from excessive demands by patent holders is the RAND commitment made by the patent holder. And because RAND commitments by themselves have proven to be vague and indeterminate, this protection can be illusory.

B. DEVELOPING RAND FIRST PRINCIPLES.

Before making an explicit proposal regarding the improvement of RAND, it is helpful to identify some basic principles that should underlie any RAND solution.

1. *Certainty is preferable to uncertainty concerning the cost of implementing a technical standard.* I list this first point at the risk of stating the obvious. Nevertheless, I do so because there are at least a few commentators who have argued that standards developers should disregard the potential cost of producing a standardized technology and focus exclusively on its technical merits. Such an approach has some appeal, particularly considering that the engineers who hash out the technical details of interoperability standards are probably ill-suited to analyze patent claims or financial data such as input costs, pricing projections, and market trends.³⁶ Moreover, any attempt by competitors to discuss financial terms of this nature within the confines of an SDO give rise to obvious antitrust and competition law issues. So is ignorance regarding patent royalty rates actually preferable to information about them? I think not.

First, it is not necessary for competing vendors to share competitive information in order to assess the potential patent-related costs of implementing various standardized technologies. Second, while engineers may not have expertise in finance or patent law, it is naïve to suppose that in today's

³⁵ See Marasco (2011), p.109.

³⁶ See Herman (2010), p. 38-39.

sophisticated technology companies engineers do not work side-by-side with legal counsel and financial analysts. Thus, it does not seem reasonable to argue that withholding information is beneficial to the standardization process, and greater certainty regarding the cost of implementing standards should be beneficial to those who are considering the design and eventual adoption of standards.

2. *There is a meaningful upper limit on reasonable royalty rates.* This point may also seem obvious, but it bears stating explicitly. A RAND commitment requires that SEPs be licensed on “reasonable” terms. While patent royalty rates vary according to a number of factors including the value of the patents, the number of patents being licensed, profit margins and manufacturing costs in the relevant industry, and overall market conditions, it must be the case that there are some finite and objective limits on the level of royalties subject to a RAND commitment. In particular, this limit must be definable by criteria other than the wishes of the patent holder. Moreover, the term “reasonable” implies that there is not a single acceptable royalty rate in a given situation, but that royalties may span some range of “reasonable” values.

The difficulty, of course, is determining that range in any given context. Intellectual property royalty rates differ drastically from industry to industry. In the semiconductor and pharmaceutical sectors, rates in the range of 0.5% to 5.0% are typical, whereas in the software industry, rates approaching 50% are not uncommon. Thus, the determination of “reasonable” rates is highly context-specific, as well as party-specific and patent-specific.

Nevertheless, numerous commentators have offered suggestions regarding the best method for evaluating the reasonableness of SEP royalty rates. One of the leading theories posits that the “reasonable” rate is the one that the vendor and the patent holder would have negotiated in an arm’s length negotiation prior to adoption of the standard (i.e., before the patent holder gained additional leverage due to the hold-up potential of the patent).³⁷ Others tie the royalty rate to the “value” of the licensed SEP in view of the overall standardized technology or product.³⁸ Still others refer to the fifteen “hypothetical negotiation” factors enumerated in *Georgia-Pacific v. United States Plywood* more than 40 years ago, and which are still cited by U.S. courts when assessing “reasonable royalty” patent damages.³⁹ And bilateralists argue that the only “reasonable” royalty is the one negotiated by a vendor and a patent holder at the time of their negotiation, no matter when it occurs.

³⁷ Farrell (2007), Lemley & Shapiro (2007), Michel (2011), FTC (2011).

³⁸ This approach was highlighted in *Lucent v. Gateway*, 580 F.3d 1301 (Fed. Cir. 2009) and has since been adopted by various commentators.

³⁹ 318 F. Supp. 1116, 1119-20 (S.D.N.Y. 1970), modified and aff’d, 446 F.2d 295 (2d Cir.) cert. denied, 404 U.S. 870 (1971). The *Georgia-Pacific* factors include:

1. The royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty.
2. The rates paid by the licensee for the use of other patents comparable to the patent in suit.
3. The nature and scope of the license, as exclusive or non-exclusive; or as restricted or non-restricted in terms of territory or with respect to whom the manufactured product may be sold.
4. The licensor’s established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly.
5. The commercial relationship between the licensor and licensee, such as, whether they are competitors in

Each of these theories has merit and may be useful for assessing the reasonableness or unreasonableness of a royalty rate in the event of a dispute. However, none of these measures (except perhaps that offered by the bilateralists, which is essentially tautological⁴⁰) offers anything close to certainty prior to or during a licensing negotiation. In other words, these theories are well-suited for assessing the reasonableness of royalty rates after they have been imposed,⁴¹ but ill-suited for assisting SDO participants in assessing rates offered by patent holders at the time of negotiation. Thus, from the perspective of a potential product vendor, the theoretical reasonable royalty rates suggested by most commentators seem no less indeterminate than the vague RAND commitment that they seek to clarify. Any “solution” to the problem of RAND indeterminacy should give greater certainty to participants in the standardization process before disputes arise.

3. *Information regarding RAND licensing terms should be available before adoption of a standard.* As discussed in Section A, licensing negotiations between patent holders and vendors work most efficiently when they occur *prior to* the adoption and lock-in of a standard. After lock-in, a patent holder obtains undue negotiation leverage based not on the value of the licensed patents, but on the fact that switching costs are so high for the vendor. Though patent holders can benefit from delaying

the same territory in the same line of business; or whether they are inventor and promotor.

6. The effect of selling the patented specialty in promoting sales of other products of the licensee; the existing value of the invention to the licensor as a generator of sales of his non-patented items; and the extent of such derivative or convoyed sales.

7. The duration of the patent and the term of the license.

8. The established profitability of the product made under the patent; its commercial success; and its current popularity.

9. The utility and advantages of the patent property over the old modes or devices, if any, that had been used for working out similar results.

10. The nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention.

11. The extent to which the infringer has made use of the invention; and any evidence probative of the value of that use.

12. The portion of the profit or of the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions.

13. The portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer.

14. The opinion testimony of qualified experts.

15. The amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount which a prudent licensee — who desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention — would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license.

⁴⁰ It is reasonable if it is reached through bilateral negotiation, therefore if it is reached through bilateral negotiation, it must be reasonable.

⁴¹ *But see* the significant literature criticizing the *Georgia-Pacific* analysis for patent damages, including Seaman (2011), Denton (2009), Durie & Lemley (2010).

licensing negotiations until after lock-in, bilateralists generally agree that it is desirable to engage in licensing negotiations prior to adoption of a standard.⁴² Thus, they maintain that they are ready, willing and able to engage in licensing negotiations prior to adoption of a standard, and that it is vendors who typically delay negotiation for the reasons discussed in Section A.

Assuming that, absent some greater inducement for vendors, most licensing negotiations will typically not occur prior to lock-in of a standard, a second-best approach might be for patent holders to give vendors more information about royalty rates prior to lock-in. Thus, instead of keeping royalty rates secret, or negotiating them confidentially on a vendor-by-vendor basis, patent holders could be required to disclose their rates and other terms to vendors prior to lock-in. Such disclosures would enable vendors to assess the potential cost of particular SEPs prior to adoption of a standard and decide whether or not to seek out a less costly technical alternative or attempt to design-around the costliest SEPs. This early disclosure approach, which has been supported by several commentators, has been termed “*ex ante*” disclosure of licensing terms, or simply the *ex ante* approach.⁴³ Advance disclosure of royalty rates, it is argued, would enable SDO participants to evaluate the cost of including particular patented technologies in a standard *prior* to adoption, and would thus enable more efficient decision making with respect to the technical design of the standard. That is, if a patent holder disclosed a royalty rate that was exorbitant, or multiple patent holders disclosed royalty rates that, in the aggregate, could not be supported by projected profits from the sale of standardized products, then standards-developers could adjust the design of the standard to avoid one or more of these patents and/or opt for an alternative, less costly technology.⁴⁴ As Mark Lemley and Nathan Myhrvold have argued in relation to licensing disclosures generally:

The only people who stand to lose from mandatory disclosure of licenses are those who are taking advantage of the current state of ignorance ... [W]e should not use claims of secrecy to prevent the development of a robust market in technology.⁴⁵

These arguments have an intuitive appeal: if one is considering purchasing something, he should be told its price. But critics of *ex ante* policies claim that requiring early disclosure of royalty rates and other licensing terms will impede standards-setting processes and create additional legal risks for participants. It has been suggested that *ex ante* licensing negotiations could facilitate the improper exchange of information among competitors (i.e., multiple competing patent holders who would otherwise not be permitted to share royalty information with one another) and thus lead to collusion regarding royalty pricing.⁴⁶ It is also claimed that potential implementers of a standard, in negotiating license terms with a patent holder, could collectively exert anticompetitive pressure on the patent holder to reduce its royalties below their reasonable level.⁴⁷ In this scenario, group pressure would

⁴² Though this position is stated publicly, there are anecdotal accounts of “foot dragging” and other delaying tactics by patent holders to push licensing negotiations later into the standardization process and closer to lock-in.

⁴³ Lemley (2007), p. 158-59, Ohana, Hansen & Shah (2003), p. 648-50, Skitol (2005), p. 741-42.

⁴⁴ See, e.g., Majoras (2005), p. 8, DOJ - VITA Letter (2006), p. 3.

⁴⁵ Lemley & Myhrvold (2007), p. 258-59.

⁴⁶ See DOJ/FTC (2007), p. 42-48.

⁴⁷ This type of anticompetitive buyer cartel is termed an “oligopsony”. See DOJ/FTC (2007), p. __, Skitol (2005), p. 735, Herman (2010), p. 38.

tend to drive all royalty rates toward zero, resulting in the devaluation of patents covering the standard.⁴⁸ This type of improper buyer cartel or “oligopsony” is avoided, so the argument goes, when patent holders are permitted to negotiate license terms with vendors on an individual, bilateral basis. Notwithstanding these arguments, regulatory agencies in both the United States and the European Union have not, by and large, expressed concern with SDO *ex ante* policies absent further anticompetitive behavior by participants.⁴⁹

Critics also maintain that *ex ante* policies are unnecessary, particularly when vendors wish to license both essential and non-essential patents in the same bundle.⁵⁰ They also contend that *ex ante* disclosure of *patents*, already required by many SDOs, is sufficient to warn standards developers of potential patent “roadblocks” and enable them to design around patented technologies if they wish.⁵¹ Finally, some critics contend that the early disclosure of licensing terms will be detrimental to the standardization process itself. They claim that it will inappropriately focus standards developers’ attention on patents and licensing issues, making the standards development process more cumbersome, lengthy and expensive. Thus, while proponents of *ex ante* policies claim that such policies will *reduce* delays caused by the threat of patent hold-up, critics of *ex ante* policies argue that such policies will *lengthen* the standardization process and, consequently, reduce the number of useful standards produced.⁵² Critics have also predicted that the adoption of *ex ante* policies by SDOs will drive members away from these SDOs, either because members are unwilling to incur the additional costs imposed by such policies (i.e., increased legal support to evaluate and address licensing disclosures), or simply because they do not wish to comply with the early disclosure requirements of such policies.⁵³ On a related note, some have argued that *ex ante* policies may lead standards developers to settle for sub-optimal technologies in order to avoid the payment of royalties on patented, but superior, technologies.⁵⁴ In each of these cases, critics argue that an SDO’s adoption of an *ex ante* policy is likely to weaken the technical output of the SDO and thus its value to members and to the economy as a whole.⁵⁵

Notwithstanding these critiques, beginning in the mid-2000s a number of SDOs including ETSI, IEEE and VITA began to discuss policy changes favoring *ex ante* disclosures. Several of these

⁴⁸ Some commentators argue that royalty-free licensing is the most appropriate solution for interoperability standards. See, e.g., Herman (2010), p. 37-38 (arguing against this position), and Updegrove (2006), p. 11-12. An assessment of this argument, however, is beyond the scope of this article.

⁴⁹ DOJ/FTC (2007), p. 53-55, European Commission (2011), ¶1299.

⁵⁰ See Paragraph 5, *infra*.

⁵¹ Herman (2010), p. 39.

⁵² See Taffet (2006), p. 15 (“[i]f it becomes necessary to evaluate the competitive effects of joint “ex ante” conduct ... the ability to conclude the technical development of a standard could be tremendously inhibited”), Herman (2010), p. 39 (“collective consideration of patent licensing issues may unacceptably delay the standards development process”), DOJ/FTC (2007), p. 50, Skitol (2005), p. 734, TAPIA (2010), p. 170.

⁵³ See Lindsay (2009) and p. 7, DOJ/FTC (2007), p. 50 (citing concerns of various panelists).

⁵⁴ See Taffet (2006), p. 15; TAPIA (2010), p. 178.

⁵⁵ See Herman (2006), p. 7-8 (combining these three critiques: “[w]ithout the participation of such key contributors, who may possess key blocking IP applying to a standard, the resulting standard may take much longer to develop and be technically inferior”).

policies were eventually adopted and approved by both the U.S. Department of Justice and ANSI. Nevertheless, the predicted ill effects of *ex ante* policies continued to surface in the literature and at conferences where such topics were debated. Thus, in 2010-11, with the support of the National Institute for Standards and Technology (NIST), my research group conducted a study to test empirically some of these process-based claims and predictions. We found no significant association between the adoption of *ex ante* policies and the predicted negative effects on standard-setting in the SDOs studied.⁵⁶ Participants in the only SDO we studied that adopted a mandatory *ex ante* policy, VITA, were quite satisfied with the policy and generally believed that it improved standard-setting at VITA.

Nevertheless, very few SDOs have adopted policies permitting *ex ante* disclosure of licensing terms, and I am aware of no SDO other than VITA that mandates such *ex ante* disclosures.⁵⁷ There are several possible explanations for this lack of adoption,⁵⁸ including self-interested opposition by patent holders, the perceived effort and inconvenience of making such disclosures, and the desire to “let sleeping dogs lie”.⁵⁹ But most important, in my opinion, is the fact that many, sometimes hundreds or thousands of, patents may be essential to the implementation of a single standard.⁶⁰ In this environment, advance disclosure of the royalty rate for a single SEP may be inconsequential given the overall field of patents to be contended with. This issue is addressed in the following section. However, despite the various criticisms of *ex ante* disclosure policies as they are currently understood, general notions of efficiency and fairness still seem to tilt the balance toward a need for greater transparency of royalty rates and other terms for SEP licenses. This is not to say, however, that mandatory *ex ante* disclosure policies themselves are likely to cure the problem of RAND uncertainty in most SDOs.

4. *Individual RAND commitments must be constrained by the aggregate royalty burden on a standard.* As the number of patents covering a single standard increase, so does the uncertainty associated with the royalty burden of implementing that standard in a product. The certainty that might be achieved through a simple *ex ante* disclosure when only a single SEP is involved is lost when multiple SEPs owned by multiple patent holders cover the standard. This situation is sometimes referred to as “royalty stacking” and has been identified by numerous commentators as a significant impediment to efficient transactions.⁶¹ Thus, even if all patent holders participating in an SDO are

⁵⁶ Contreras (2011).

⁵⁷ The case of NGMN (discussed at note 62, *infra*) is somewhat different, as disclosures were made on an anonymous basis. As noted above, such anonymous disclosures resulted in royalty rates that were likely overstated. Some commentators have argued that even non-anonymous *ex ante* disclosures of maximum royalty rates would be overstated (Herman (2010), p. 38), though there is no evidence that this has been the experience at VITA.

⁵⁸ These rationales are discussed in greater detail in Contreras (2013).

⁵⁹ See Section A.2.c, *supra*.

⁶⁰ For example, ETSI’s legal advisor reported in 2007 that approximately 4,700 patents had been disclosed as essential to implementation of the GSM standard, 7,700 for UMTS and 3,500 for 3GPP. Fröhlich (2007), p. 9.

⁶¹ See, e.g., Shapiro (2004), Lemley & Shapiro (2007), Lemley (2007), p. 152.

required to disclose their royalty rates before lock-in, and even if each patent holder's royalty rate might, on its face, appear "reasonable", the aggregate of such disclosed royalties might be excessive.⁶²

The issue, thus, is not only one of disclosure, but of magnitude. As many commentators on the stacking issue have pointed out, the aggregate royalty burden that results from multiple separate royalty demands can be excessive and has the potential to make a standardized technology uncompetitive in the marketplace. This is the case even if individual royalty rates meet some threshold of "reasonableness" when considered separately. As Joseph Farrell explains, "[t]his is because the sum of the incremental values of [multiple] patents exceeds their value in combination."⁶³ Herein lies the greatest problem with the bilateralist approach. One-on-one bilateral negotiation of royalty rates and other terms may yield efficient results when only one patent holder is involved. But when multiple patent holders emerge, it is difficult, if not impossible, for a vendor to negotiate simultaneously with each of them to reach an aggregate royalty rate that is "reasonable" from the vendor's standpoint. The reason this issue arises is that none of the patent holders is required to take into account the rates charged by the others. In fact, without information sharing that might be anticompetitive, such coordination is not possible. Yet the result of five, or ten, or twenty separately-negotiated "reasonable" royalties can easily be a single aggregate royalty that is unreasonably high. It is thus critical that, in the context of technical standards, any assessment of the "reasonableness" of an individual patent holder's royalty rate take into account the overall number of SEPs applicable to a standard and the aggregate royalty burden on the standard.^{64/65}

5. *Non-SEPs need not be bundled with SEPs.* In the vast majority of SDOs, RAND commitments apply only to SEPs, patents that are "essential" to the implementation of a standard in a product. There is a common refrain among bilateralist commentators that attempting to determine "reasonable" terms for RAND licenses is, at best, an exercise in irrelevancy, as most vendors want licenses that cover

⁶² This situation is reported to have occurred in the Next-Generation Mobile Networks consortium (NGMN). NGMN required its members to disclose their maximum SEP royalty rates and other licensing terms for certain ETSI standards on an anonymous basis. These rates were then compiled by a neutral third party. One commentator reports that in at least one case the resulting aggregate royalty rate reached 130% of the net sale price of the standardized equipment. Tapia (2010), p. 194. *See also* Contreras (2011), p. 13-14.

⁶³ Farrell, et al. (2007), p. 642.

⁶⁴ It is important to note that the aggregate royalty burden on a technology is not one of the fifteen *Georgia-Pacific* factors (note 39, *supra*): another reason that *Georgia-Pacific* does not offer a suitable analytical framework for assessing RAND commitments.

⁶⁵ This position is advocated by Farrell, et al. (2007), p. 642 ("It will then be important to consider all essential patents when establishing the fair and reasonable royalty for any one patent, and to have some mechanism to allocate the aggregate royalty among the patent owners").

more than SEPs.⁶⁶ That is, holders of SEPs also hold a variety of other patents that are useful, but not essential, to products that implement standards. And because RAND policies, by their terms, apply only to SEPs, patent holders can charge whatever the market will bear when they license non-SEPs. Thus, a vendor who wishes to obtain a license for a package of SEPs and non-SEPs is not protected by the patent holder's RAND assurance, and the terms of the license will be determined by bilateral negotiation and market pricing, in any event.

But this conclusion is far from foregone. It rests on the assumption that the bundling of SEPs and non-SEPs is driven by vendor (purchaser) demand rather than patent holder (seller) desire, and that some non-SEPs are so critical to the design, operation or commercial success of a standardized product that vendors *require* a license in order to deal in the product. The bilateralist argument assumes that virtually all vendors will want to license a SEP/non-SEP package of patents, and that very few will want to license only SEPs. Yet one need only look to industries in which patent pools are prevalent (e.g., data formats in consumer electronics such as CD, DVD, etc.) to see that this is not always the case. When a patent pool relating to a standardized technology is formed, the parties expend significant resources to ensure that *only* SEPs are included in the pool.⁶⁷ Thus, nearly all licensees of pooled patents receive a SEP-only license. If vendors wish to gain access to technologies beyond those covered by the relevant standard, they enter into separate negotiations with the patent holder. But this is not the norm. Thus, industries such as home entertainment consumer electronics are replete with SEP-only licenses.

The second major bilateralist assumption is that some non-SEPs are so critical to the design, operation and commercial success of a standardized product that virtually all vendors will require a license in order to manufacture or sell the product. This begs the question, however, of what patents are actually "essential" to the standard. Traditionally, essential patents (or, more precisely, essential patent *claims*) must be technically necessary to implement a mandatory (i.e., non-optional) portion of a standard.⁶⁸ However, some parties have argued that if a patent claim covers a technological feature that is commercially essential to implement the standardized technology, then this patent should also

⁶⁶ Herman (2010), p. 38 (arguing that implementers "generally do not want a license only to essential claims, but rather to all of the patent claims that their commercial implementations infringe..."). For example, Company X may hold a patent that is essential to implement a standard for compressing digital images on mobile telephones. Company X may also hold patents covering its market-leading technology for enhancing the color of compressed digital images. Color enhancement technology may not be part of the image compression standard, but most camera phone manufacturers would wish to use color enhancing technology along with the image compression standard. Thus, the patent holder would seldom license the standards-essential patents separately, and the relevant royalty would be what it charged for the combination of image compression and color enhancement patents. This rate, however, would not be covered by Company X's RAND commitment, as such commitment would only extend to SEPs.

⁶⁷ Under applicable antitrust/competition law guidelines, patent pools should include only SEPs. See DOJ/FTC (2007), p. 76-78. This condition has been relaxed somewhat in recent cases when the status of a patent at the point of pool formation is unpredictable, but by and large this requirement remains.

⁶⁸ See ABA (2007), p. 18-19 (discussing differences between "technically essential" and "commercially essential" patent claims).

be considered a SEP and be subject to the SDO's RAND policy.⁶⁹ This approach has been taken in several prominent patent pools relating to standards in the consumer electronics industry and has been approved by the U.S. Department of Justice in this context.⁷⁰

I do not take sides in this particular debate. I only raise the question of commercial essentiality in order to highlight the point that the SEP/non-SEP boundary is not entirely clear. Thus, the bilateralist argument that vendors almost always wish to license non-SEPs in addition to SEPs, thereby rendering RAND commitments irrelevant, could also be answered by expanding the universe of SEPs to include commercially essential patents. Doing so would increase the scope of a patent holder's RAND commitment and weaken the argument against focusing on RAND solutions.

6. *SEPs should not be used to block implementation of a standard unless the recovery of monetary compensation is impossible.* Ordinarily, one of the remedies available to a patent holder is an injunction preventing an infringer from further infringing activity. Injunctions, together with their close cousins the exclusion orders issued by the U.S. International Trade Commission (ITC), thus have the potential to prevent the sale and distribution of an infringing product in the market covered by a patent. Much has been written lately regarding the appropriateness of injunctive relief when a patent holder has committed to license its patents on FRAND terms to implementers of a standard.⁷¹ That is, if a patent holder has committed to license its SEPs to all vendors on FRAND terms, but is unable or unwilling to reach agreement with a particular vendor, one may ask whether the patent holder sue the vendor for patent infringement and prevent the vendor's further manufacture and sale of the standardized product. The analysis of this question depends heavily on the relevant tribunal and jurisdiction, and commentators in the U.S. have been quick to point out the differences between the standards for injunctive relief in federal court (enunciated by the Supreme Court in *eBay v. MercExchange*) and at the ITC (which uses a more flexible "public interest" standard of review).⁷² Standards for injunctive relief likewise differ among European jurisdictions, with Germany quickly gaining a reputation for the ability of its courts to consider and issue injunctive remedies.⁷³

In this paper, I do not attempt to evaluate the many legal arguments and doctrines that have been raised in the debate over injunctive relief and RAND commitments. Rather, I rely on a few simple "first principles". First, it seems clear that a patent holder that has made a RAND commitment must be willing to license its SEPs at *some* price. A patent holder who has committed to license to all vendors on RAND terms has indicated to the world that it will not exclude others from treading on patented territory. And that commitment is not given gratuitously. Rather, the patent holder has made its RAND commitment in exchange for the privilege of participating in the development of the standard on

⁶⁹ See Walker (2012), p. 5.

⁷⁰ Klein (1997), p. 9-10; Klein (1998), p. 3; Klein (1999), p. 3.

⁷¹ See, e.g., Michel (2011); Lichtman (2009); Miller (2007).

⁷² Chien & Lemley (2012), Chien, et al. (2012), Yeh (2012). See also *Apple v. Motorola* (2012), p. 18-35 (denying injunctive relief to both parties given the adequacy of monetary damages to redress their alleged injuries). But see Submission of the Office of Unfair Import Investigations on Remedy and the Public Interest, In re. Certain Wireless Communication Devices, Portable Music and Data Processing Devices, Computers and Components Thereof, Inv. No. 337-TA-745, U.S. ITC (Jul. 9, 2012) (in which ITC staff finds that "The mere existence of a FRAND obligation does not preclude issuance of an exclusion order").

⁷³ See, e.g., Scott Flaherty, *German Court Sides with Motorola in Microsoft Patent Fray*, Law360, Oct. 9, 2012.

which its patents read.⁷⁴ If the standard is adopted and the patent holder emerges with SEPs covering the standard, then it should be required to live up to its end of the bargain and license all vendors who wish to manufacture or sell standardized technology.

Of course, disputes arise when parties cannot agree on the terms of a license. If the patent holder has offered RAND terms to a “rogue” vendor who unjustifiably refuses to pay a reasonable royalty, must the patent holder permit that bad actor to continue to operate under its SEPs while the dispute over payment drags on? Unfortunately for the patent holder, the answer is almost certainly ‘yes’. Given the uncertain parameters that RAND places on the parties, the patent holder would gain inappropriate leverage if it were entitled to block vendors from the market during the pendency of RAND disputes. Thus, the patent holder’s first and primary avenue for redress against a non-paying vendor is an action for monetary damages.

But now suppose that an adjudicatory body (for the moment putting aside the question of *which* such body) determined that the patent holder’s proffered royalty rate *was* reasonable, and that the vendor was unjustified in withholding payment? Or suppose that the non-paying vendor is judgment-proof, either by virtue of bankruptcy protection or location in a jurisdiction beyond the reach of the patent holder? Would the patent holder then be justified in seeking injunctive relief to prevent further infringement by the rogue vendor? In these cases, principles of equity and fairness tend to favor the patent holder. Thus, if a patent holder is found to have offered a royalty that is reasonable within the meaning of its RAND commitment and its actions for monetary damages have been unsuccessful or cannot be maintained due to legal or jurisdictional obstacles, then injunctive relief preventing the further manufacture and sale of the standardized product by the defaulting vendor would be appropriate.⁷⁵

7. *RAND commitments should travel with the patent.* It is now fairly widely acknowledged that RAND commitments made by a patent holder with respect its SEPs should bind any subsequent holder of those SEPs.⁷⁶ The logic and fundamental fairness of this proposition are intuitive, so I will not dwell on this point beyond stating that it should also be considered a “first principle” necessary for building a robust solution to the RAND problem.

⁷⁴ *Apple v. Motorola* (2012), p. 18-20.

⁷⁵ The case of the U.S. ITC is a curious one, in that its remedial powers are limited to injunction-like exclusion orders against infringing products. Some have argued that the ITC, which has no power to award monetary damages, should not be restrained from issuing exclusion orders, even in the face of a patent holders’ RAND commitment. I do not find the arguments in this vein to be persuasive, except in the case noted above in which a suit for monetary damages has been unsuccessful or the infringer is beyond the jurisdictional reach of the patent holder. *See also* Wayland (2012), p. 10-11; Chien, et al. (2012), p. 8-9. If a petitioner at the ITC can bring a claim for monetary damages against an infringer in federal or state court, then it should do so in lieu of its ITC claim, and the ITC action should be dismissed or at least held in abeyance until the conclusion of that suit for monetary damages. To this point, in most of the pending ITC cases in which this issue has arisen, the parties are simultaneously litigating in federal district court, not to mention the courts of various other countries.

⁷⁶ Wayland (2012), p. 9; Scott-Morton (2012), p. 2; Contreras (2012a) (describing consensus among Microsoft, Apple and Google on this point and general approval by the U.S. DOJ).

C. RETHINKING RAND – A PSEUDO-POOL APPROACH

In this Section I present a proposed framework for addressing RAND uncertainty that draws upon the first principles elucidated above. I do not claim that this proposal is entirely original. Rather, it draws on the previous work of many scholars, attorneys and policy makers. I do hope, however, that a new approach to some of these old questions may inspire SDOs to address the significant uncertainty that currently surrounds RAND commitments and thus to alleviate some of the litigation burden that affects the standard-setting community.

1. *Patent Pools – Birds of a Different Feather.* Before describing the details of my proposal, it is worth spending a moment on patent pools. In a patent pool, multiple patent owners contribute or license patents to a common agent (sometimes one of the patent holders and sometimes a third party administrator). This agent then offers licenses to the entire pool at a single royalty rate, and net revenues are allocated among the pool participants in accordance with a pre-determined formula. Because a vendor seeking to implement such a standard can obtain a license to many patents simultaneously, all at a single royalty rate, commentators view patent pools as potential solutions to the patent stacking problem.⁷⁷ Patent pools have been used effectively in connection with widely-adopted consumer electronics standards such as the MPEG audio compression format,⁷⁸ the DVD video compression format⁷⁹ and third generation wireless communications standards.⁸⁰ In each of these cases the U.S. Department of Justice approved the proposed pool, pointing to features that reduced potentially anticompetitive effects.⁸¹ For example, each such pool contained only patents that were essential to the implementation of the standard; licensees were always free to obtain patent licenses directly from the patent holders, rather than from the pool; licensing of the pooled patents was conducted on a non-discriminatory basis; and any licenses that the patent holders required from their licensees only covered patents that were, themselves, essential to implementation of the standard.⁸²

Patent pools address many of the “first principles” needed to reduce RAND uncertainty: royalty rates and other terms are determined and made available at the outset, a single royalty covers all

⁷⁷ See, e.g., ABA (2011), p. 130-31. Patent pools are most effective at eliminating stacking problems, of course, when all patents essential to a standard are included in the pool. Conversely, problems can arise when essential patents are *not* included in the pool. This situation arose in the case of the Federal Communication Commission’s (FCC) ATSC standard for digital television transmission. Though many holders of patents essential to implementation of the ATSC standard did form a patent pool, one patent holder, Funai Electric Company, did not join. Instead Funai sought to charge royalties for its single patent at a rate equal to that charged by the entire ATSC pool (approximately 5 percent of the television price). When Funai sought to bar imports of televisions by Vizio, Inc., a U.S. manufacturer that refused to pay this royalty, Vizio sought temporary relief from the FCC. Resp’ts Req. Temporary Relief, *Vizio, Inc. v. Funai Electric Co.*, 24 F.C.C.R. 2880 (Feb. 20, 2009). Though the matter was rendered moot because Vizio was found not to infringe the asserted patent (*Vizio, Inc. v. Int’l Trade Comm’n*, 605 F.3d 1330 (Fed. Cir. 2010)), the dispute highlights the risks that can arise when patent pooling arrangements do not include all relevant patent holders.

⁷⁸ Klein (1997).

⁷⁹ Klein (1998) and Klein (1999).

⁸⁰ James (2002).

⁸¹ DOJ/FTC (2007), p. 74-85.

⁸² *Id.* at 68-84.

patents in the pool, and only SEPs are included in the pool. But the certainty and efficiency afforded by patent pools comes at a cost. This cost arises in the form of the substantial up-front expense associated with pool formation. Unlike voluntary, consensus standards bodies, which permit (or require) patent holders to disclose any patents that they deem to be essential to the implementation of the standard (often resulting in substantial over-disclosure⁸³), patent pools must *ensure* from the beginning that all patents placed in the pool are essential. This requirement flows from the risk that a patent pool may stifle competition if it contains patents covering technologies that are substitutes for one another. Under this theory, allowing patents on substitute technologies in the same patent pool could have the result of fixing prices on such competing technologies.⁸⁴ For this reason, the parties forming patent pools typically engage in a lengthy and expensive process (usually through external counsel engaged for the purpose) of vetting each patent that is proposed to be included in the pool and ensuring its essentiality.

Such a vetting process would be cost-prohibitive in the context of SDO-based standards development. Unlike patent pools, which generally focus on discrete standards for well-defined product categories, some SDOs produce hundreds or thousands of standards in a wide range of areas.⁸⁵ Many SDO standards are never widely-adopted or have limited application, making such a massive investment of resources a highly dubious proposition. In contrast, relatively little up-front investment is required in SDO-based standardization: patents are voluntarily declared as essential by patent holders, and the actual essentiality of such patents is not tested unless and until litigation ensues. While this structure relies on litigation to resolve questions regarding patent essentiality, its significant cost savings makes it far more desirable in the SDO context. Thus, while patent pools have a number of characteristics that could significantly alleviate the uncertainty inherent in RAND-based licensing, patent pools are not viable substitutes for the current SDO RAND-based licensing system. In the next section, however, I explore how some of the beneficial features of patent pools can be imported into the SDO RAND-based licensing structure.

2. *A Pseudo-Pool Approach to RAND.* As discussed in the preceding section, patent pools address many of the “first principles” needed to reduce RAND uncertainty: royalty rates and other terms are determined and made available at the outset and a single royalty covers all patents in the pool. However, the up-front investment of time and money that is required to create patent pools is prohibitive in the context of SDOs. Thus, I propose a “pseudo-pool” approach that incorporates some of the beneficial features of patent pools while preserving the flexibility and broad activity scope that is inherent in the SDO model. Below I outline the principal features of the pseudo-pool approach. I do not claim that this proposal offers a complete solution to all of the problems and uncertainty affecting standards development, or that it will curtail the current litigation that is being played out in courts across the globe. Moreover, I acknowledge that further work is required to analyze how such a proposal would be implemented in real SDOs, each having their own constituencies, histories and idiosyncrasies. I also recognize that competition authorities may wish to consider whether this deviation from the traditional formally-structure patent pool model offers sufficient procompetitive

⁸³ See Section A.2.b, *supra*.

⁸⁴ See DOJ/FTC (2007), p. 76-78; Klein (1999), p. 3; Decision and Order, *In re Summit Tech., Inc.*, 127 F.T.C. 208, 217 (1999) (No. 9286).

⁸⁵ For example, Dirk Weiler of ETSI reports that as of September 2012, 126,602 patents had been declared as essential to 4,854 different ETSI standards (Weiler (2012), p. 4)

benefits to offset any potential anticompetitive risk. But with these caveats, I hope that this proposal may be of use to SDOs seeking to address RAND uncertainty.

In broad terms, the pseudo-pool approach can be summarized as follows:

a. *Declaration of SEPs.* Patent holders will be required, much as they are today, to declare SEPs based on their good faith evaluation of the essentiality (technical and/or commercial) of such patents to a standard under development.

b. *Aggregate Royalty Determination.* Prior to final approval of a standard, the SDO (through an appropriate work group that includes both patent holders and potential product vendors) will establish an aggregate royalty ("Aggregate Royalty") to be shared by all holders of SEPs declared on the standard. Such Aggregate Royalty must be "reasonable", taking into account the expected overall market for standardized products, historical royalty rates in the industry, and the like, but participants will be expressly prohibited from discussing individual company pricing or marketing plans. The Aggregate Royalty determination will also establish the appropriate revenue base on which royalties will be calculated (e.g., net revenue from sales of components, subassemblies, complete products, related services, etc.). An SDO may also wish to consider authorizing a neutral, outside party (e.g., WIPO) to facilitate the Aggregate Royalty determination process.

c. *Licensing of SEPs.* Each patent holder must agree to license its SEPs to all vendors on RAND terms negotiated bilaterally (other than the Aggregate Royalty). Alternatively, the SDO may elect to establish a uniform form of SEP license agreement to be used by all patent holders. This approach would eliminate further uncertainty surrounding the scope of non-royalty RAND terms such as reciprocity and defensive suspension.

d. *Split of Royalties.* The Aggregate Royalty will be published on the SDO's web site. Each patent holder will receive a share of the Aggregate Royalty based on the number of declared SEPs that it holds, subject to the Over-Declaration Adjustment described below. Such allocation may be based on simple proportionality (e.g., the patent holder's share = n/Σ_N), on a step function/tiered basis (e.g., 0-10 patents yields one "share", 11-25 patents yields two "shares", etc.) or another objective numerical method. Attempting to allocate royalties by any method other than quantity of patents, such as the perceived value of specific patents, is likely to lead to protracted negotiation and dispute. The proposed method, while perhaps less precise than might be achieved using a more finely-tuned valuation method, is intended to provide "rough justice" in an efficient and easy to administer manner.

Each patent holder's share of the Aggregate Royalty will be published on the SDO's web site, together with payment instructions for licensees. A licensee will be obligated to pay to each patent holder, during each royalty reporting period, the share of the Aggregate Royalty then due to such patent holder. It is possible that a patent holder's share may change over time due to, among other things, the declaration of additional SEPs on the standard, the expiration or adjudged invalidity of SEPs, and the application of the Over-Declaration Penalty.

e. *Over-Declaration Penalty.* In order to deter over-declaration of SEPs, the SDO will establish a procedure whereby any person may challenge the essentiality of a declared SEP. This procedure may be conducted internally at the SDO or by a third party adjudicator (e.g.,

WIPO). The cost of such adjudication will be borne by the “losing” party in such procedure. If an SEP is found, through such procedure, not to be essential to the relevant standard, then the patent holder’s share of the Aggregate Royalty will be reduced (the “Over-Declaration Penalty”) by some factor greater than represented by a single patent (e.g., if two patents are found not to be essential, then the patent holder’s share may be reduced by the value of four patents). While this procedure is not as rigorous as the third party essentiality assessment typically conducted by patent pools, it is hoped that the incentive structure established by the Over-Declaration Penalty will regulate disclosure appropriately. A finding of non-essentiality will not be binding on a subsequent court proceeding, though an SDO may wish to consider whether to require participants to abide by such findings and refrain from litigation following such an essentiality determination.

f. *Independent Licensing Permitted.* As with most patent pools, parties will be permitted to license SEPs outside of the pseudo-pool structure. This will be necessary if vendors wish to license both SEPs and non-SEPs from a patent holder. Clarifying the definition of “essentiality” will ensure that patents that are truly essential to the implementation of a standard are classified as SEPs and not held-back from the pseudo-pool in order to charge for them outside the Aggregate Royalty.

g. *Waiver of Injunctive Relief.* Patent holders should contractually waive their right to seek injunctions on SEPs unless the recovery of monetary damages is impossible.

h. *Transfer of Patents.* Commitments made with respect to SEPs should bind any future transferee of such SEPs. Patent holders should be contractually bound to require, as a condition of transfer, that any transferee of a SEP agree to abide by all commitments made regarding that SEP within the SDO context. Such commitment should also bind all subsequent transferees.

3. *Discussion.* The pseudo-pool approach described above borrows from numerous earlier proposals made by scholars, attorneys and policy makers over the years. The idea of an aggregate cap on SEP royalties, in particular, is not new.⁸⁶ Such a proposal was also made to ETSI by Research in Motion (RIM) in 2005.⁸⁷ Discussion of this proposal at ETSI was terminated, however, following a 2006 letter from the European Commission’s Competition Directorate-General.⁸⁸ The letter stated that such a royalty cap could preclude price competition, as the price of each SEP would be fixed in advance.⁸⁹ The Commission expressed instead a strong preference for “pure” *ex ante* disclosures of royalty terms, which would enable price competition among competing patented technologies. The Commission’s analysis is, on its face, not unreasonable. However, in the years that have elapsed since the letter was prepared, the standards-development landscape has evolved. I would thus urge the Commission to

⁸⁶ See, e.g., Farrell, et al. (2007), p. 642 (“FRAND implies an additional constraint on royalties: the sum of the royalty rates for any group of essential patents cannot exceed the combined value of all of these patented technologies to the standard”); Lemley (2007), p. 161 (proposing a cap and step-down approach).

⁸⁷ Tapia (2010), p. 165-66.

⁸⁸ Cocera (2006).

⁸⁹ Additional concerns have been raised by Herman (2010), p. 39-40; and Gerardin (2006), p. 10-11 and 13-15. Many of these objections are addressed by the proposal set forth herein.

reconsider its 2006 position, at least as it may apply to the instant pseudo-pool proposal, in light of the following:

First, collective royalties have been approved repeatedly by competition and antitrust authorities reviewing patent pooling arrangements (both before and after the 2006 letter), with the acknowledgement that such arrangements can confer significant procompetitive benefits, so long as they are bounded appropriately (e.g., limited to essential patents). An Aggregate Royalty for SDO declared SEPs is very similar to a collective royalty on pooled patents.

Second, despite the potential procompetitive advantages that they offer, *ex ante* disclosure policies have *not* been adopted widely among SDOs for the reasons outlined in Section B.3 above. Thus, the price competition among patented technologies envisioned by the Commission has not occurred. Instead, licensing negotiations for SEPs continue to be conducted in secret, bounded only by imprecise RAND commitments.

Third, in the pseudo-pool approach outlined above, there is a significant opportunity for negotiation and price competition among patented (and non-patented) technologies during the procedure used to establish the Aggregate Royalty. In particular, patent holders who participate in this negotiation will be free to make their case for the inclusion of their patented technology, and others will be free to consider whether or not the proposed addition to the Aggregate Royalty justifies inclusion. U.S. regulators have considered the possibility of such *ex ante* joint negotiations of licensing terms and have indicated that they will evaluate such negotiations under the “rule of reason” due to their potential procompetitive benefits.⁹⁰ Such joint negotiations have also been endorsed by numerous commentators both in the U.S. and Europe.⁹¹ As early as 2005, Chairman Deborah Platt Majoris of the U.S. FTC explained the many potential procompetitive benefits of joint *ex ante* negotiation of licensing terms in the SDO context:

[J]oint ex ante royalty discussions ... can be a sensible way of preventing hold up, which can itself be anticompetitive. Put another way, transparency on price can increase competition among rival technologies striving for incorporation into the standard at issue. They may allow the “buyers” (the potential licensees in the standard-setting group) to get a competitive price from the “sellers” (the rival patentees vying to be incorporated into the standard that the group is adopting) before lock in ends the competition for the standard and potentially confers market power on the holder of the chosen technology. ... If joint ex ante royalty discussions succeed in staving off hold up, we can generally expect lower royalty rates to lead to lower marginal costs for the standardized product and lower consumer prices. By mitigating hold up, joint ex ante royalty discussions might also make possible the more timely and efficient development of standards. A reduction in ex ante uncertainty on royalty rates may “reduce the extent to which litigation is needed to resolve issues relating to patent and standards.” Joint ex ante royalty discussions also could prevent delays in the implementation of the standard resulting from ex post litigation (or threats of it), which may involve “inefficient allocation of resources intended for innovation.”⁹²

⁹⁰ DOJ – VITA (2006), p. 9, n. 27; DOJ/FTC (2007), p. 54.

⁹¹ See, e.g., Gilbert (2011), p. 858; Tapia (2010), p. 159; Lemley (2007), p. 161; Skitol (2005).

⁹² Majoras (2005), p. 7-8 (citations omitted).

For all of these reasons, it should be possible, with adequate precautions in place, to ensure that price competition *does* occur in the face of the pseudo-pool Aggregate Royalty proposed herein. Such a proposal alleviates many of the problems caused by the inherent uncertainty of RAND commitments without imposing substantial additional costs on the SDO standardization system. Accordingly, I recommend that such a proposal be considered seriously by SDOs seeking to reduce current inefficiency and disputes in standards-development.

CONCLUSION

RAND licensing commitments have been utilized by SDOs for years in an attempt to alleviate the risk of patent hold-up in standard-setting. These commitments, however, have proven to be vague and offer few assurances to vendors or patent holders. A recent surge of international litigation implicating RAND commitments has brought this issue to the attention of regulators, industry and the public, and many agree that a solution is called for.

In this paper, I identify seven “first principles” that underlie many of the policy debates surrounding the licensing and enforcement of SEPs. These can be summarized as follows: (1) certainty is preferable to uncertainty concerning the cost of implementing a technical standard, (2) there is a meaningful upper limit on reasonable royalty rates, (3) information regarding RAND terms should be available before adoption of a standard, (4) individual RAND commitments must be constrained by the aggregate royalty burden on a standard, (5) non-SEPs need not be bundled with SEPs, (6) SEPs should not be used to block implementation of a standard unless the recovery of monetary compensation is impossible, and (7) RAND commitments should travel with the patent.

Based on these first principles, I propose an SDO-driven approach to addressing the uncertainty of RAND commitments that is based on certain beneficial attributes of patent pools. I call this approach a “pseudo-pool” approach, as it draws on pooling strategies, but is adapted for use in the more flexible and prolific world of SDO standard-setting. The pseudo-pool proposal includes the following elements: (a) SDO participants continue to declare SEPs in good faith, (b) SDO working groups that include patent holders and potential vendors establish aggregate royalty rates for each standard, (c) patent holders continue to grant licenses on RAND terms, subject to the overall royalty agreement, (d) each patent holder is entitled to a share of the aggregate royalty based on a proportionality measure, (e) there is a penalty for over-declaration of SEPs, (f) each patent holder is permitted to license its SEPs independently of the pseudo-pooling arrangement, (g) parties must waive their right to seek injunctive relief for infringement of SEPs unless monetary damages have proven impossible to collect, and (h) commitments made with respect to SEPs must bind all future transferees of such SEPs. This proposal requires the adoption of joint *ex ante* negotiation of royalty rates near the outset of a standardization project, conduct that has been viewed with favor by several regulatory agencies and acknowledged as offering various procompetitive benefits. I thus urge SDOs to consider the adoption of policies that make use of some or all of the proposals made here, as there is an urgent need to address the inherent uncertainty of RAND licensing commitments as they exist today.

REFERENCES

- AMERICAN BAR ASSOCIATION (ABA) (2011), HANDBOOK ON ANTITRUST ASPECTS OF STANDARD SETTING (2ND ED., Chicago: ABA Publishing)
- (2007), STANDARDS DEVELOPMENT PATENT POLICY MANUAL (Jorge L. Contreras, ed., Chicago: ABA Publishing)
- AMERICAN NAT'L STANDARDS INST. (ANSI) (2012), ANSI ESSENTIAL REQUIREMENTS: DUE PROCESS REQUIREMENTS FOR AMERICAN NATIONAL STANDARDS
http://publicaa.ansi.org/sites/apdl/Documents/Standards%20Activities/American%20National%20Standards/Procedures,%20Guides,%20and%20Forms/2012%20ANSI%20Essential%20Requirements%20and%20Other%20Updated%20Procedures/2012_ANSI_Essential_Requirements.pdf
- Apple, Inc. v. Motorola, Inc.*, No. 1:11-cv-08540, Opinion and Order (N.D. Ill., June 22, 2012) (Posner, J.)
- Rudi Bekkers & Andrew Updegrove, A Study of IPR Policies and Practices of a Representative Group of Standard Setting Organizations Worldwide, Presented to National Academies of Science Symposium on Management of IP in Standards-Setting Processes, Session 4 (Oct. 3, 2012) (http://sites.nationalacademies.org/xpeditio/groups/pgasite/documents/webpage/pga_072197.pdf)
- George S. Cary, Mark W. Nelson, Steven J. Kaiser & Alex R. Sistla (2011), *The Case for Antitrust Law to Police the Patent Holdup Problem in Standard Setting*, 77 ANTITRUST L.J. 913
- George S. Cary, Larry C. Work-Dembowski & Paul S. Hayes (2008), *Antitrust Implications of Abuse of Standard-Setting*, 15 Geo. MASON L. Rev. 1241
- Colleen Chien, et al. (2012), *RAND Patents and Exclusion Orders: Submission of 19 Economics and Law Professors to the International Trade Commission*, Santa Clara University School of Law Legal Studies Research Paper Series (No. 07-12, Jul. 2012) (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2102865) (Note: the author is one of the signatories to this Submission)
- Colleen V. Chien & Mark A. Lemley (2012), *Patent Holdup, the ITC, and the Public Interest*, _ Cornell L. Rev. _ (2012)
- Angel Tradacete Cocera, Letter to Karl Heinz Rosenbrock, Director General ETSI, June 21, 2006
- Jorge L. Contreras (2013), *Technical Standards and Ex Ante Disclosure: Results and Analysis of an Empirical Study*, _ Jurimetrics _ (Winter 2013, forthcoming)
- (2012a), *The February of FRAND*, Patently-O, Mar. 6, 2012 (<http://www.patentlyo.com/patent/2012/03/february-of-frand.html>)
- (2012b), *The FRAND Wars: Who's on First*, Patently-O, Apr. 17, 2012 (<http://www.patentlyo.com/patent/2012/04/the-frand-wars-whos-on-first.html>)
- (2011), Natl. Inst. Standards & Tech. Study Report, *An Empirical Study of the Effects of Ex Ante Licensing Disclosure Policies on the Development of Voluntary Technical Standards* (GCR 11-934, June 27, 2011) http://gsi.nist.gov/global/docs/pubs/NISTGCR_11_934.pdf
- F. Russell Denton (2009), *Rolling Equilibriums at the Pre-Commons Frontier: Identifying Patently Efficient Royalties for Complex Products*, 14 VA. J.L. & TECH. 48, 83-84
- U.S. Dept. of Justice (DOJ) (2006), *Business Review Letter to VMEbus International Trade Association (VITA)* (Oct. 30, 2006)
- (2007), *Business Review Letter to Institute of Electrical and Electronics Engineers (IEEE)* (Apr. 30, 2007)
- U.S. Dept. of Justice (DOJ) & U.S. Fed. Trade Comm. (FTC) (2007), ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION
- (1995), ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY
- Daralyn J. Durie & Mark A. Lemley (2010), *A Structured Approach to Calculating Reasonable Royalties*, 14 LEWIS & CLARK L. REV. 627

Richard A. Epstein, F. Scott Kieff & Daniel F. Spulber, (2012), *The FTC, IP, and SSOs: Government Hold-Up Replacing Private Coordination*, 8 J. Comp. L. & Econ. 1

European Commission (2011), Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-operation Agreements

Fairfield Resources Intl. (2007), *Analysis of Patents Declared as Essential to GSM as of June 6, 2007*
(http://frlicense.com/GSM_FINAL.pdf)

--- (2008) *Review of Patents Declared as Essential to WDCMA Through December, 2008*
(<http://www.frlicense.com/wcdma1.pdf>)

Joseph Farrell, John Hayes, Carl Shapiro & Theresa Sullivan (2007), *Standard Setting, Patents, and Hold-Up*, 74 Antitrust L.J. 603

U.S. Federal Trade Commission (FTC) (2011a), THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION

--- (2011b), Request for Comments and Announcement of Workshop on Standard-Setting Issues, 76 Fed. Reg. 28,036 (May 13, 2011)

Michael Fröhlich (2007), *The Interface Between Standards and IPRs – The ETSI IPR Policy*, Presented at The Standards Edge Conference: ‘Building Economic Strength and Social Benefit’, Beijing, 17-18 Apr. 2007

Bernhard Ganglmair & Emanuele Tarantino (2011), *Patent Disclosure in Standard Setting*, NET Institute Working Paper #11-15

Damien Gerardin (2006), *Standardization and Technological Innovation: Some reflections on ex-ante licensing, FRAND, and the proper means to reward innovators*, TILEC Discussion Paper (DP 2006-17) (June 2006)

Richard Gilbert (2011), *Deal or No Deal? Licensing Negotiations in Standard-Setting Organizations*, 77 Antitrust L.J. 855

Michele K. Herman (2010), *How the Deal is Done, Part 1*, LANDSLIDE, Sept/Oct 2010

--- (2006), *The Quandary of a Balanced IPR Policy*, Licensing J., Oct. 2006, at 5

Christopher B. Hockett & Rosanna G. Lipscomb (2009), *Best FRANDs Forever? Standard-Setting Antitrust Enforcement in the United States and the European Union*, Antitrust, Summer 2009

Justin Hurwitz (2008), *The Value of Patents in Industry Standards: Avoiding License with Voluntary Rules*, 36 AIPLA Q.J. 1

Charles A. James (2002), Letter to Ky P. Ewing, Esq., Vinson & Elkins L.L.P. re. 3GPP (Nov. 12, 2002), available at <http://www.justice.gov/atr/public/busreview/200455.htm>

Joel I. Klein (1997), Letter to Gerrard R. Beeney, Esq., Sullivan & Cromwell re. MPEG-2 (June 26, 1997), available at <http://www.justice.gov/atr/public/busreview/215742.htm>

--- (1998), Letter to Gerrard R. Beeney, Esq., Sullivan & Cromwell re. 3C DVD-video (Dec. 16, 1998), available at <http://www.justice.gov/atr/public/busreview/2121.htm>;

--- (1999), Letter to Carey R. Ramos, Esq., Paul, Weiss, Rifkind, Wharton & Garrison re. 6C DVD-ROM (June 10, 1999), available at <http://www.justice.gov/atr/public/busreview/2485.htm>

Anne Layne-Farrar, A. Jorge Padilla & Richard Schmalensee (2007), *Pricing Patents for Licensing in Standard-Setting Organizations: Making Sense of RAND Commitments*, 74 ANTITRUST L.J. 671

Mark A. Lemley (2002), *Intellectual Property Rights and Standard-Setting Organizations*, 90 CAL. L. REV. 1889

--- (2007) *Ten Things to do About Patent Holdup of Standards (and One Not To)*, 48 BOSTON COLL. L. REV. 149

Mark A. Lemley & Nathan Myhrvold (2007), *How to Make a Patent Market*, 36 HOFSTRA L. REV. 257

Mark Lemley & Carl Shapiro (2007), *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991

Doug Lichtman (2010), *Understanding the RAND Commitment*, 47 Hous L. Rev. 1023

Michael A. Lindsay, *Negotiating Royalty or Other License Terms Before the Standard is Set* (presented at Am. Intell. Prop. L. Assn. 2009 Spring Meeting) (available at http://www.dorsey.com/files/upload/lindsay_negotiating_royalties_AIPLA_spring09.pdf)

Deborah Platt Majoras (2005), *Recognizing the Procompetitive Potential of Royalty Discussions in Standard Setting*, Remarks prepared for "Standardization and the Law: Developing the Golden Mean for Global Trade", Stanford Law School, Sept. 23, 2005

Amy Marasco (2011), Oral Comments, Transcript: Federal Trade Commission – Tools to Prevent Patent "Hold-Up" (June 21, 2011)

Suzanne Michel (2011), *Bargaining for RAND Royalties in the Shadow of Patent Remedies Law*, 77 Antitrust L.J. 889

Joseph Scott Miller (2007), *Standard Setting, Patents, and Access Lock-In: RAND Licensing and the Theory of the Firm*, 40 Ind. L. Rev. 351

Earl Nied (2011), Oral Comments, Transcript: Federal Trade Commission – Tools to Prevent Patent "Hold-Up" (June 21, 2011)

Gil Ohana, Marc Hansen & Omar Shah (2003), *Disclosure and Negotiation of Licensing Terms Prior to Adoption of Industry Standards: Preventing Another Patent Ambush?* [2003] EUROPEAN COMPETITION L. REV. 644

Qualcomm, Inc. (2011), Comments of Qualcomm Incorporated Submitted to FTC Patent Standards Workshop (Jun. 13, 2011) (<http://www.ftc.gov/os/comments/patentstandardsworkshop/00011-60525.pdf>)

Marc Rysman & Tim Simcoe (2008), *Patents and the Performance of Voluntary Standard Setting Organizations*, 54 MANAGEMENT SCI. 1920

Christopher B. Seaman (2011), *Reconsidering the Georgia-Pacific Standard for Reasonable Royalty Patent Damages*, 2010 B.Y.U. L. Rev. ____

Fiona Scott-Morton (2012), *Policies, Practices, and Experiences of Leading Standards Organizations*, Presentation to National Academies of Science Symposium on Management of Intellectual Property in Standard-Setting Processes, Oct. 3, 2012, Washington DC (http://sites.nationalacademies.org/xpeditio/groups/pgasite/documents/webpage/pga_072703.pdf)

Carl Shapiro (2004), *Navigating the Patent Thicket: Cross-Licenses, Patent Pools and Standard Setting*, in 1 Innovation Policy and the Economy 119 (Adam B. Jaffe et al. eds.)

Robert A. Skitol (2005), *Concerted Buying Power: Its Potential For Addressing The Patent Holdup Problem in Standard Setting*, 72 Antitrust L.J. 727

Adam Speegle (2012), Note, *Antitrust Rulemaking as a Solution to Abuse of the Standard-Setting Process*, 110 Mich. L. Rev. 847

Richard S. Taffet, *Ex Ante Licensing in Standards Development – Myths and Reality* (presented to AIPLA Spring Meeting, May 4, 2006) (available at <http://www.bingham.com/Media.aspx?MediaID=2742>)

CLAUDIA TAPIA (2010), *INDUSTRIAL PROPERTY RIGHTS, TECHNICAL STANDARDS AND LICENSING PRACTICES (FRAND) IN THE TELECOMMUNICATIONS INDUSTRY* (Köln: Carl Heymanns Verlag)

Andrew Updegrave (2006), *Ex Ante Disclosure: Risks, Rewards, Process and Alternatives*, Consortium Standards Bul., June 2006

Kent Walker (2012), Letter to Hon. Patrick J. Leahy and Hon. Chuck Grassley, Jul. 10, 2012

Joseph F. Wayland (2012), *Antitrust Policy in the Information Age: Protecting Innovation and Competition* (Remarks Prepared for Fordham Competition Law Inst., New York, Sept. 21, 2012) (<http://www.justice.gov/atr/public/speeches/287215.pdf>)

Dirk Weiler (2012), *Welcome to the World of Standards*, Presentation to National Academies of Science Symposium on Management of IP in Standards-Setting Processes, Session 4 (Oct. 3, 2012) (http://sites.nationalacademies.org/xpeditio/groups/pgasite/documents/webpage/pga_072720.pdf)

Brian T. Yeh (2012), *Availability of Injunctive Relief for Standard-Essential Patent Holders*, CRS Report for Congress 7-5700 (Sept. 7, 2012)